

## 233-S DECOMMISSIONING PROJECT

### MEMORANDUM OF UNDERSTANDING

For

### FOCUSED READINESS ASSESSMENT

## **1.0 INTRODUCTION AND BACKGROUND**

### **1.1 Introduction**

This Memorandum of Understanding (MOU) notifies the Richland Operations Office of the Department of Energy (DOE-RL) of the Bechtel Hanford Inc (BHI) 233-S Decommissioning Project's intent to conduct a Focused Readiness Assessment (FRA) to ensure safe continuation of decommissioning activities in the process area of 233-S. This MOU also describes the approach BHI will use to validate the readiness of the remaining 233-S Decommissioning Project activities.

The FRA will provide the objective evidence of project readiness for activities to the BHI Approval Authority (BHI-AA). The BHI Approval Authority will then make the declaration of readiness to the DOE-RL Approval Authority (RL AA).

### **1.2 233-S Plutonium Concentration Facility Description**

The 233-S Facility is composed of the 233-S Plutonium Concentration Building and the 233-SA Exhaust Filter Building. The 233-S Plutonium Concentration Facility is a reinforced concrete structure (37 ft by 86 ft) with 8-in.-thick walls and 6-in.-thick floors. The 233-SA Filter Building is a one-story, 16 ft by 24 ft reinforced concrete structure with 6-in.-thick walls located on a 24-ft-square, 8-in.-thick, reinforced concrete pad at the northeast corner of the 233-S Plutonium Concentration Facility (see Appendix A for description).

The 233-S Facility was operated between 1955 and 1967. The facility supported 2" and 3" diameter plutonium concentration cycles at the REDOX complex. Neptunium was also processed and loaded out in the 233-S Facility. The 233-S Facility has been inactive for over 30 years and has no identified future use that would justify a partial cleanup/maintenance approach. The building is significantly contaminated and has undergone structural deterioration due to exposure to extreme weather conditions. A freeze and thaw cycle occurred at the Hanford Site during February 1996, which caused cracking of portions of the building's roof. This resulted in significant infiltration of water into the facility, which creates a pathway for potential release of radioactive material into the environment (i.e., via air and/or ground). The weather also caused existing cracks in the concrete structures of the building to lengthen, thereby increasing the potential for failed confinement of the radioactive material in the building. Differential settlement has occurred, causing portions of the facility to separate from the main building structure, increasing the potential for the release of radioactive material to the environment.

Decommissioning activities are being performed in a manner that prevents the release of hazardous substances to the environment and minimizes personnel exposures to levels as

low as reasonably achievable (ALARA). The removal of facility components, the dismantlement of the facility structures, and the processing of generated wastes create conditions that could release contamination to the atmosphere.

The scope of work presented for this Focused Readiness Assessment includes the removal of residual fissile material, dismantlement of facility equipment and systems, decontaminating facility surfaces, dismantling facility structures, and the storage/disposition of waste products in the areas listed below.

#### **1.2.1 PMMA Panel Removal**

The existence of the PMMA panels that separate the viewing room and process hood represent a combustible fuel loading in this facility area that could potentially create a fire hazard of a magnitude to breach the final exhaust system filters. Hazard evaluations have shown that combustion of the PMMA panels could create temperatures sufficient to consume the filters, resulting in environmental releases of radioactivity. To initially eliminate this condition, it is proposed that operations required for the removal of the PMMA panels be performed prior to the extensive dismantlement operations involved in the process system removal.

##### **1.2.2 Process Hood Decontamination**

Because the PMMA panels separate a highly contaminated area (i.e., the process hood) from a moderately contaminated area (i.e., the viewing room), it is first necessary to perform decontamination to reduce both areas to a safe operational zone. Both areas will be cleaned to a level conducive to worker entry with appropriate respiratory protection.

#### **1.2.3 Process Hood Equipment Removal and Decontamination**

The process hood in the 233-S Facility contains a multi-vessel array of pipes and plumbing that was configured and controlled to concentrate plutonium solutions transferred from the 202-S Building. This assembly will be dismantled to eliminate the major source of fissile material.

##### **1.2.4 Equipment Draining**

A systematic check of the process systems in the hood will be performed to ensure that internal liquids are not present. Collected liquids from the systems will be sampled and analyzed for fissile material content. It is anticipated that the liquids may qualify as TRU waste and may be solidified in accordance with TRU waste acceptance criteria if necessary.

##### **1.2.5 Process System Removal**

The dismantlement and removal of the process pipe system in the process hood will be performed in a manner to permit both convenience of operation and control of conditions.

An engineered sequence of process system component removal will be developed and implemented in these operations. After completing process system removal, the major fissile material inventory in the 233-S Facility will have been removed, and the need for the nuclear categorization for the facility should no longer exist.

#### **1.2.6 Exhaust System Modifications**

Prior to initiation of operations in the process hood, it will be necessary to modify the existing facility exhaust system. This modification will allow the exhaust from the process hood and viewing room to exit the bottom of the rooms, rather than the top of the room, as currently is the case. This modification will vastly improve worker safety with respect to radiological controls and will require maintenance and testing of the portable 9,000-cfm exhauster. This modification will replace the use of 233-SA Building Exhausters as the primary permitted stack.

#### **1.2.7 233-S and 233-SA Building Exhaust Duct Removal**

All ductwork will be removed and packaged and sent to the appropriate Hanford Site waste-receiving site. During the removal of the exhaust ducting surface coating removal and decontamination will be performed concurrently. This will involve the removal of contamination fixatives, foam, tar and gravel roofing materials, asbestos-bearing insulation, and final decontamination of the concrete or metal primary roof structure.

### **2.0 NEW START OF DECOMMISSIONING ACTIVITIES**

These activities are classified as new start activities within a nuclear facility. In the previous ORR (June 1998) the RL ORR Team did not conclude that the 233-S Project had adequate programs in place to make a determination of readiness for future work activities. The RL ORR Team recommended that in order to assess the level of readiness for future work, a Focused Readiness Assessment (RA) should be conducted prior to commencing work in the next process area and should include a review of specific Core Requirements identified in Section 5 below.

### **3.0 HAZARD CATEGORY THE FACILITY**

A quantitative hazard evaluation performed for the 233-S Facility Decommissioning Project defined the building as a Hazard Category 2 nuclear facility and is documented in the 233-S Authorization Basis Document (0233S-AB-G0001). The basis for the determination is documented in appendix H of the Authorization Basis Document. The 233-S Facility is contaminated with hazardous substances used in or generated by plutonium concentration operations. Most of the hazardous substances are radioactive materials that contaminated the interior of the 233-S Facility. Fissile material inventories are also known to exist; the major inventory of fissile material is contained within the vessels and piping of the process hood, but some fissile contamination is found

throughout most of the facility. Current radiation survey data indicate that fixed contamination exists in all rooms and on the roof. Smearable plutonium (alpha) and minor, mixed fission products (beta)gamma) contamination exists in the process hood, viewing room, product receiver (PR) can loadout room, stairwell, stairwell airlocks, and pipe gallery.

Note: After completing process system removal, the major fissile material inventory in the 233-S Facility will have been removed, and the need for the nuclear categorization for the facility should no longer exist.

#### **4.0 THE MEANS OF CONDUCTING THE FRA**

The breadth and depth of this FRA are those Core Requirements identified in the RL ORR Final Report (June 1998) and are identified in Section 5.0 below. Work package instructions are acknowledged as the detailed directives that identify the concerns, requirements, responses, and efforts involved in each project task. Design Packages are being developed for some activities to assist in the development of the field-level work packages and identify specific details for dismantlement, control, precautions and hold points. Field-level work packages will be developed to direct work activities in each task, using the most recent information concerning facility conditions and instructing workers in the most applicable work methods. For this FRA review, work packages will be developed and approved for the Process Hood Decon, Exhaust System Modification, PMMA Panel Removal and Duct Removal and Roof Decon, Process Piping/Equipment Removal.

The 233-S Decommissioning Project will perform a Project Management Assessment (PMA) and, when satisfied that readiness has been achieved, will issue a Statement of Readiness to the Manager of ERC Compliance and Quality Programs.

The ERC Compliance and Quality Programs Manager will then perform a Focused Readiness Assessment (Level 11 RA) and, when satisfied that readiness has been achieved, will issue an approved final report. The Project Manager will then issue a Memorandum to proceed to DOE RL for completion of the Focused Readiness Assessment.

The RL AA will perform a Focused Readiness Assessment of 233-S Decommissioning activities presented and when satisfied readiness has been achieved, will grant startup approval for all future decommissioning activities identified in the table below.

TABLE 1

**233-S Plutonium Concentration Facility**  
~~NEW STARTS for Decommissioning~~

Activity Name	Contractor Review	DOE Review	Review Type	Approval Authority	Scheduled Start	POC
Exhaust System Modification	2/99	3/99	FRA	RL	4/99	YE. -Logan
Process Hood Decon	2/99	3/99	FRA	RL	6/99	T.E. Logan
233-S & 233-SA Building Exhaust Duct Removal & Roof Decon	2/99	3/99	FRA	RL	6/99	T.E. Logan
PMMA Panel Removal	2/99	3/99	FRA	RL	9/99	T.E. Logan
Process Hood Equipment Removal & Decon	2/99	3/99	FRA	RL	12/99	T.E. Logan
233-SA Equipment Removal and Decon	11/99		Level I RA	BHI	1/00	T.E. Logan
Old Filter House Removal	2/00		Level II RA	BHI	4/00	T.E. Logan
233-SA Building Structure Dismantlement	3/00		Level I RA	BHI	5/00	T.E. Logan
233-S Facility Interior Surface Decon	5/01		Level I RA	BHI	7/01	T.E. Logan
Floor Drainage System Removal	6/01		Level II RA	BHI	8/01	T.E. Logan
233-S Building Structure Dismantlement	8/01		Level I RA	BHI	10/01	T.E. Logan
Process Pipe Trench Removal	11/02		Level I RA	BHI	1/03	T.E. Logan
Building Concrete Slab & Footer Removal	11/02		Level I RA	BHI	1/03	T.E. Logan
Final Site Radiation Survey	11/02		Level I RA	BHI	1/03	T.E. Logan

## **5.0 JUSTIFICATION FOR THE MEANS OF REVIEW**

The 233-S Decommissioning Project has been designated as a new start and is designed to use lessons learned and fieldwork experience to safely perform and optimize ongoing and future work. In support of this goal, a phased readiness determination was planned to allow D&D craft personnel, who will work in the pipe trench, load out hood and process hood, to gain experience while working in non-process piping and equipment areas. Phase one (Non-Process area and Equipment Room) is complete. The second phase (pipe trench and loadout hood) is underway and was authorized by RL in June of 1998 after an Operational Readiness Review was conducted in May of 1998. These work activities have been accomplished without any lost workday cases, no skin contamination's, no unplanned uptakes and no OSHA recordable injuries in over 60,000 hours of work.

In this previous ORR (June 1998) the RL ORR Team did not conclude that the 233-S project had adequate programs in place to make a determination of readiness for future work activities. The ORR Team recommended that in order to assess the level of readiness for future work, a focused Readiness Assessment (RA) should be conducted prior to commencing work in the next process area and should include a review of the following Core Requirements (CR):

- CR-1 - There are adequate and correct safety limits and correct procedures for operating systems, CR-8C - Management programs are established for radiological protection, CR-8G- Management programs are established for criticality safety,
- CR-9 - An emergency operations drill program has been established, CR-10 - A program has been established to determine the functional capability of removal
- equipment, CR-12 - The implementation status of conduct of operations is adequate, CR-15 - Facility systems and procedures affected by facility modifications
- are consistent with the procedures and accident analysis in the safety basis, and
- CR-20 - DOE operations office oversight programs are adequate.
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The RL ORR team also recommended that the focused RA should be conducted per RL Implementing Directive (RLID) 425.1, Startup and Restart of Facilities, Attachment 8.2, paragraph 2.3.4, which defines the process for performing a Contractor RA followed by a RL RA.

## 6.0 PREREQUISITES FOR STARTING FRA REVIEW

This MOU will use the "Core Requirements" of DOE Order 5480.31 as identified in the DOE/RL ORR (dune 1998) Report listed below.

### 6.1 Requirement (CR-1)

There are adequate and correct safety limits for operating systems. There are adequate and correct procedures for operating systems and **utility** systems.

#### Prerequisites

There are no safety limits identified for operating systems in the safety basis document, which defines the safety envelope.

A project management assessment has been completed that verifies administrative procedures, task instructions, and work packages are established and control the implementation of the requirements of the safety basis, or a means to ensure that work packages to be developed implement the requirements of the safety basis. Work packages will contain Lessons Learned from previous work activities.

### 6.2 Requirement (CR-SC & CR-8G)

Management programs are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure support services are adequate for operations.

#### Prerequisites

Radiological Protection - A project management assessment has been completed that verifies qualified personnel and adequate equipment is available to implement requirements specified in the Authorization Basis and Radiation Work permits.

Criticality Safety - A project management assessment has been completed that verifies qualified personnel and adequate equipment is available to implement requirements specified in the Authorization Basis and Criticality Safety Analysis.

### 6.3 Requirement (CR-9)

An emergency drill program, including program records, has been established and implemented. Routine operations drill program, including program records, has been established and implemented.



Prerequisite

A project management assessment has been completed that verifies appropriate personnel have been trained and an emergency drill program is established and implemented.

6.4 Requirement (CR-10)

A program has been developed to determine that the functional capability of removal equipment, the viability of instructions and training of project personnel.

Prerequisite

A project management assessment has been completed that verifies that results of dismantlement tasks have been documented, or a program established to ensure that these results will be reviewed, to determine the functional capability of equipment, viability of instructions, and adequacy of training of workers. Areas requiring improvement are or will be documented. Revisions to procedures, work instructions, and training requirements have been or will be completed prior to the start of work. Appropriate personnel have been trained or will be trained to the modifications made to the work packages and work instructions prior to the commencement of work.

6.5 Requirement (CR-12)

The implementation status for Doe Order 5480.19, "Conduct of Operations Requirements for DOE Facilities," is adequate for operations.

Prerequisite

A project management assessment has been completed that verifies the Project Manager's Implementing Instructions (*PMII*) which translates Conduct of Operations principles, guidelines, and procedures into performance requirements is in place. Project personnel are familiar with the performance standards applicable to their duties and are knowledgeable on how to respond to changed work or facility conditions.

6.6 Requirement (CR-15)

Facility systems, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the

safety basis. Facility procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis.

#### Prerequisites

A project management assessment has been completed that verifies the facility systems and procedures have been reviewed and revised or a program is in place to review or revise, as necessary. This is to ensure that they are consistent with the description of the facility, procedures, and accident analysis included in the safety basis.

#### 6.7 Requirement (CR-20)

Operations Office Oversight Programs, such as Occurrence Reporting, Facility Representative, Corrective Action, and Quality Assurance programs, are adequate (DOE Only).

#### Prerequisites

Verify that DOE operations office oversight programs are adequate.

### 7.0 THE LEVEL OF INVOLVEMENT BY THE CONTRACTOR, INCLUDING INDEPENDENCE OF THE REVIEW TEAM

To ensure independence, the team leader of the Contractor Focused Readiness Assessment (Level II RA) shall not be associated with the project and will be provided by the BHI Compliance and Quality Programs organization.

#### 8.0 OFFICIAL START APPROVAL AUTHORITY

The BHI Approval Authority for the start of these activities is Mr. Michael C. Hughes and he is responsible for concurring with the Readiness to Proceed Letter prepared by the Decommissioning Project Manager.

### 9.0 ANTICIPATED START DATE

The Project Management Assessment (PMA) is scheduled to start on February 5, 1999, the independent Contractor FRA (Level II RA) is scheduled to start on March 11, 1999 and the Readiness to Proceed Letter is scheduled to be submitted to DOE/RL on March 24, 1999.

#### 10.0 REVIEWS AND APPROVALS

*BHI* reviewers and approvers are Messrs. M.C. Hughes, T.E. Logan, and A.B. Chaloupka.

#### 11.0 DISTRIBUTION

This document will be distributed to Document Information Services, DOE Project Manager, Decommissioning Project Manager, Vice president of Operations, 233-S Decommission Task Lead, Manager of Field Support, Manager of Engineering and Technology, Manager of Compliance & Quality Programs, Safety & Health, and the FRA Team Members.